JSC/EC5 U.S. Spacesuit Knowledge Capture Series Synopsis

Topic: Kosmo's Farewell Advice

Date: December 6, 2011 **Location:** Johnson Space Center (JSC), Houston, TX

Presenter: Joe Kosmo interviewed by Amy J. Ross

Synopsis: Joe Kosmo shared some final words and advice for his teammates in the Spacesuit and Crew Survival Systems Branch (EC5) and the Crew and Thermal Systems Division (CTSD (EC)) upon his retirement. He knew nothing about spacesuits when he started working for NASA in 1961, but neither did anyone else. He summed up the best lessons learned during his 50 years of developing U.S. spacesuits and encouraged the next generation's space industry workers to challenge what they hear and decide what is right.

Biography: Joseph Kosmo was graduated from Pennsylvania State University in 1961 with a bachelor of science in aeronautical engineering. In 1978, he earned a master of science in environmental management from the University of Houston – Clear Lake. In 1961, Kosmo began his career with the NASA Space Task Group at Langley, Virginia, in the Crew Systems Division, working on the Mercury Program spacesuit. During the past 45 years, he has participated in the design, development, and testing of Mercury, Gemini, Apollo, Skylab, and Space Shuttle spacesuits, as well as numerous advanced technology configuration spacesuits and EVA gloves for future mission applications. Kosmo received the American Astronautical Society's Victor A. Prather Award, the NASA Exceptional Service Medal, and the Astronaut Silver Snoopy Award. The United States Space Foundation Space Technology Hall of Fame recognized him for his work on the development of the liquid cooling garment for spacesuit and medical applications. He has pursued the development of advanced spacesuits, gloves, and ancillary EVA-supporting hardware concepts for future planetary surface exploration. For about 10 years, Kosmo has organized and led a team of engineers in a series of remote field site test activities of prototype extravehicular hardware, advanced communications systems, spacesuit mobility studies, and human and robot assistant interactive capabilities in a variety of locations, including Death Valley, the Mojave Desert, and northern Arizona. In 2011, he retired from NASA after a 50-year career in the space industry.

Video Length and Size: 1:27:32 (3.074 GB)

NASA Johnson Space Center
Crew and Thermal Systems Division
EC5 Space Suit and Crew Survival Systems Branch
2101 NASA Parkway
Houston, TX, 77058

jsc-us-spacesuit-knowledgecapture@mail.nasa.gov

Joe Kosmo referenced or read from several files during his interview and they have been provided below in the following order.

1. Richard S. Johnston Oral History Data Sheet
2. Transcript: History of Early NASA Manned Flights by Richard S. Johnston
3. U.S. Human Spaceflight Chronology
4. Advanced EVA Project Funding – 21-Year History Overview
5. “Where Did the Old NASA Innovative Spirit Go?”

The oral histories on this Website are the transcripts from audio-recorded, personal interviews with many who pioneered outer space and the Moon, and with those who continue the excitement of space exploration. To preserve the integrity of the audio record, the texts are presented with limited revisions and thus reflect the candid conversational style of the oral history format. Brackets and ellipses indicate where the text has been annotated or edited for clarity. The date of each interview is noted on the first page.

If available, the Biographical Data Sheet provided background information for the Oral Historian to prepare for the interview. A project research historian submitted the data sheet on the date listed at the end of the file.

To continue, choose a link below:

		Oral History
Richard S. Johnston	Biographical Data Sheet	August 11, 1998 September 2, 1998 November 3, 1998 December 2, 1998

ORAL HISTORY TRANSCRIPT

RICHARD S. JOHNSTON
INTERVIEWED BY SUMMER CHICK BERGEN
HOUSTON, TEXAS – 11 AUGUST 1998

BERGEN: This is an interview with Richard Johnston on August 11, 1998 in the Signal Office in Houston, Texas. The interviewer is Summer Chick Bergen. Camera is Carol Butler, audio is Shannon Rinde.

Mr. Johnston, thank you for being with us and giving us the honor of doing this oral history interview. We appreciate it. Let's start, basically, at the beginning of your involvement with NASA. How did you get involved with working at NASA?

JOHNSTON: Well, I was working at Bureau of Aeronautics in Washington, D.C., and I heard they were setting up NASA, a thing called the Space Task Group [STG]. I submitted an application to NASA headquarters. About two weeks went by, and I called a guy named George [M.] Low and said, "I haven't heard anything from you."

He said, "I can't understand that. You'll hear from somebody this afternoon."

I got a call from a guy named Bob [Robert R.] Gilruth, who was the director. He said, "You haven't heard from Max [Maxime A.] Faget yet?"

I said, "No." [Laughter]

So he said, "Well, Max will call you this afternoon."

So Max called and we talked a few minutes. Max, by the way, probably one of the smartest guys that worked at NASA. Anyhow, he said, "Yes, we want to hire you. We'd like you to come to work tomorrow." [Laughter]

So I said, "Wait a minute. I'm living in Washington, D.C., and you're down in Virginia." I said, "Why don't I drive down tomorrow and meet you and find out what you really want me to do."

So I drove down by myself and I met with Max. Max is a very smart guy, but he's hard to understand. He really is. Anyhow, I talked to him for about an hour, and then I drove around looking at housing.

My wife and I just bought a new home up outside of Washington, D.C. So I drove back home and we were sitting in front of the fireplace, and I said, "You know, I met this guy named Max Faget." I said, "I really didn't understand what he wanted me to do. I know he's smarter than hell, but I don't know what he wants."

So my wife says, "Why don't we drive back down tomorrow."

So I drove back down the next day and I met a guy named Bob [Robert O.] Piland. Bob made a lot more sense and whatever. Anyhow, within two weeks I moved. We put the house that we just bought, we rented it, because we thought we were coming back up to where the Goddard Space Center is.

Anyhow, we moved down there and we rented a house. I went in primarily to worry about the environmental control system for the Mercury spacecraft. I was there a month or so, and nobody was really taking care of the spacesuits. I knew something about the spacesuits, because I'd worked at the Bureau of Aeronautics and was involved with understanding that sort of thing. So I went to Max and said, "Max, who's taking care of the spacesuits?"

He said, "Well, really no one. Why don't go out to Rayfield [phonetic] and talk to them."

So I went out there. Then I came back and I went in and talked to Max again. I said, "Max, you know what? The Air Force, they're forcing you all to take their suit. It isn't the right suit."

So he said, "Well, why don't you go back out there and set up an evaluation program." He said, "One of those suits, you think?"

I said, "Well, you ought to look at the Navy suit. You ought look at a suit that International Latex [Corporation] built."

So I went back out there and talked to them. I was in a big circle, and told these Air Force people, I said, "We're going to evaluate three suits." I said, "We'll do it here." Well, boy, they jumped all over me. I said, "Well, I'm going to tell you something, if the people I work for don't want to support me, I'm going to resign, but I'm not going to take this kind of stuff from you people."

So anyhow, we did the evaluation there. You would know that they came in and said they ought to pick the David Clark [Company] suit, which was the wrong suit. So we ended up picking the B. F. Goodrich suit. So that was how I got started in the spacesuit business. I hired a guy to handle the ECS [Environmental Control System] and I hired a guy to handle the suits.

Then there was an animal program, and there's a guy named Jim [James P.] Henry was going to run it, a colonel in the Air Force. He wasn't coming in until summer. I went to a meeting and somebody said, "Did anybody take any notes?"

I said, "I did." So I wrote the minutes of that meeting.

So a guy named Charlie [Charles J.] Donlan, who was a deputy director, he said, "These notes are wonderful. Why don't you run the animal program."

I said, "Okay." So I took over the animal program. So I had the ECS, the suits, the animal program, and the bioinstrumentation. I got three or four people working for me. One day they called me and they said, "You know, we've got these doctors and no one's paying any attention to them. They do what they want. We're going to put them altogether in a branch. Stan [Stanley C.] White will be the branch head and you'll be the assistant branch head. You run the place."

So that's how I got started. I don't know, it was a whole bunch of things. Working in the Mercury Program was like going into a candy shop. There was so many things you could do. You just had to say, "I'll do them."

But anyhow, I didn't mean to tell you the whole story of my life. But they were exciting days. I got to know all the original seven astronauts.

I'll tell, you know, Alan [B.] Shepard [Jr.] just died two weeks ago. I had a meeting with all the seven astronauts and I said, "I'm going to tell you what we're going to do. We're going to buy you a training suit, a flight suit, and a back-up suit."

Alan Shepard said, "If I were Bob Gilruth, I'd fire you."

I said, "Oh, really?" I said, "Why don't you sit there and be quiet and let me explain this to you." So I went through, I said, "Do you need a training suit? Do you want to fly with it?"

He said, "No."

Okay. I said, "You're down at the Cape [Canaveral, Florida], you're ready to go, and the zipper on your flight suit breaks. Would you like a back-up?"

He said, "Yes."

I said, "Well, then what I just told you makes sense." And we were friends from then on. [Laughter]

So anyhow, they were good days. Working in the Space Task Group with Gilruth and Charlie Donlan and Max Faget. I can't remember other people. But I just loved my job. I went to work every day, I got up in the morning and I was really ready to go. My whole career with NASA was that way.

We finally, they started Gemini, and by that time I probably had, I don't know, maybe thirty or forty people in that branch. They announced that we were going to move to Houston. In fact, I came down here and picked a building out up on Wayside Drive that was where our crew systems was located. Actually, it was called life systems then. We got

involved with—well, in fact, we'd bought the first altitude chamber that the center had and put in the old Lane Wells Building up on Wayside Drive. They were just great days. Just great days. We ended up with all the medical people working in the division for a long time, until Chuck [Charles A.] Berry decided we ought to move them out and he should have them. But I really enjoyed running that division. We just did a lot of stuff.

Then Gemini came along and we needed a new suit. So we actually went to the Air Force suit and used it for all the flights in Gemini. We ended up making an EVA [Extravehicular Activity] suit. We had a fourteen-day mission and we even made a soft suit that the guys could put on and take off.

I'm trying to think what else I could tell you about the spacesuits. The suit business was, I think, one of the most interesting parts of the job I had. The environmental control system was being built by Air Research. I had a branch that managed that and we had another branch and handled the medical instrumentation and whatever. I really had a group of people working for me in crew systems that were just great people. We all respected each other. We didn't have any fights or arguments. Once in a while, I had to fire somebody, but not often. I just loved running crew systems. It was probably the best job I ever had at NASA.

Anyhow, we did all the things we had to do for Gemini. You know, I could probably, I guess if I really reach back in my mind, could tell you stories of things we did. Our first EVA, George Low came back from the Cape and about a week before the first Gemini launch, the Russians had gone EVA. So he called me and Chuck [Charles W.] Matthews, Deke [Donald K.] Slayton, and Warren [J.] North over to his office. He said, "Could we go EVA on the next mission?"

I said, "George, I don't know."

This is on a Thursday. He said, "Why don't you go over and I want your division to handle all of it, including that zip gun, and you handle getting that hardware built."

I said, "Okay."

He said, "I don't want anybody to know we're doing this."

I said, "All right."

So I went back to my office, I told my secretary, I said, "I want you to cancel all my appointments tomorrow. There's a group of guys I want to have in the office tomorrow and we're going to design a chest pack for that mission and the zip gun."

And I walked into Low's office the following Tuesday with a mock-up of all these equipment. We built it in less than two and a half months and flew it. In fact, I have a picture of Ed [Edward H.] White [II] at home on my wall with that thing on. It was a great experience. That's the only crew that came by my office on the way to the Cape to thank me and the people who worked for me, for what we did for them.

I went to an IEF meeting in Paris about, I don't know, a month or so after this. Ed White and Jim [James A.] McDivitt came over with, I guess, Lyndon [B.] Johnson. I got a call saying I should meet them out at the Paris Air Show. Well, I gave my paper. I didn't have any money, but I figured how I'd get out there. I went out and I watched the gate. One gate would open for people to go through. So I stood there and I thought, "Oh, hell, I'm going to get my NASA badge out. I'll just hold it and walk on in." So I did. [Laughter]

I walked on over to a building where there was a big press conference going on. There were a lot of people there, just a lot of people. Anyhow, I walked into that thing and I didn't get up on the stage and I didn't do any talking, but as we were getting ready to leave, somebody said, "Would you like us to fly you back in the center of Paris on a helicopter?"

I said, "Sure, I'd love it."

So anyhow, I did, and they invited me to a party they were having that night. Funny thing is, we left the NASA administrator sitting out at the airport. He was talking. [Laughter]

But anyhow, I've had a lot of good experiences like that. In fact, I'd spent so little time with my family, we were going to up to a ranch up in the hill country as soon as I got back. Mr. [James E.] Webb told me, I was in the car with him and he said, "You want to fly back on the Air Force One with us?"

I said, "Hell, I'd love to."

He said, "Well, be at the airport Sunday morning and you'll be on board." He said, "Call this guy."

So I called some guy that worked for him. I said, "You know, Mr. Webb invited me to ride back on Air Force One with you all."

He said, "I don't know if we're going to have room for you. Why don't you just bring your bags and come out to the airport and if we've got room, we'll let you get on board. If not, I don't know what you're going to do."

I said, "I'm going to tell you something, fellow. I've worked my butt off the last two months to get Ed White EVA going and I'm not coming out there and wasting my time. If you can't tell me I don't have a seat on the airplane, I'm not going." So I went on, I had a first-class seat on a flight back to New York.

About a month later, Webb came through with some visitors and he said, "Boy, where were you on that airplane?"

I said, "Mr. Webb, I shouldn't say this, but I'm going to. You've got a bunch of jerks working for you."

He said, "Really?"

I said, "Yes." I said, "I talked to them on the phone like you told me to, and they told me to come out to the airport. They didn't know if there'd be room." I said, "I worked night and day for a couple of months getting this thing done, and, frankly, I've neglected my family. I wasn't going out to the airport and sit around and watch you all take off and then I got to go

figure out how I'm going to get back home." I said, "I had a first-class seat on an airplane and if the guys working for you don't any more about me than that, I wasn't worried about it."

Well, Gilruth was standing there, he didn't know what to say. [Laughter] But I treated people like that. I mean, you got to be willing to say what you feel like. I got along well with Mr. Webb.

I don't know what else I could tell you about Gemini. Gemini was a very interesting program. We built a special suit for the fourteen-day mission, which was a soft suit that the guys could take off. I don't know really what else I could tell you about the program. Well, we had a lot of medical experiments. I still had the medical people working for me, that we did in the Gemini Program.

While I was over on a flight, I went into England and I went out to Fornborough [phonetic] to give a paper. There was a guy named John Billingham, who was a flight surgeon. He was interested in coming over here to work. So I went by his house and spent the evening with he and his wife. We brought John over. John, he stayed with us quite a while, but he ended up going out to the Ames Research Center. His wife is a physician, also. He was a great addition to our staff. He really was. But the Fornborough thing was, it was fun giving the paper. I don't know where I went from there. But anyhow, I guess, I went on over into Paris. I don't know. I used to go to Europe quite a bit. But John Billingham was a great find.

Let's see. What else can I tell you about Gemini? The Gemini Program was a very interesting spacecraft and the systems and everything you built into it. We had some problems with some of the stuff at times, but, by and large, it was a good program. Some of the astronauts got into problems when they were EVA. I think that we learned a lot about EVA from that program. I really don't know what else I could say about Gemini. I think we learned an awful lot about the medical aspects of space flight from Gemini. We did a lot of experiments.

I had a guy named Larry Dietman [phonetic]. He's still out there. He was a Public Health physician. But we had quite a group of medical experiments that we carried on. The biggest flights that we did those on was, I think, Gemini VII was the biggest one. We really had a pile of stuff that we did with those guys. I don't know what else I can say about the medical aspects of Gemini. I think we did learn an awful lot. We published some good reports from that mission. I don't know what else I can say about Gemini. We had good suits.

I had two branches in the division. One took care of the Apollo stuff and then another group took care of the Gemini stuff. They were a great group of people. Several of them have died, which is unfortunate. Ted Hayes [phonetic], Jim Corrielli [phonetic], Matt [Matthew I.] Radnofsky they all had worked for the Navy and I had gotten to know them when I was in the Bureau of Aeronautics.

Then we got some people from the Air Force. Charlie Lutz [phonetic]. I'm trying to think who else. But anyhow, we had a very good group of people that were loyal to each other and took care of each other. We just had a good group of people who relied on each other. Nobody took offense when somebody called them down on something or whatever. We all trusted each other, and that's how that division succeeded.

In fact, I won't get into the Apollo fire right now, but it was right after the Apollo fire, I was working for Max. Max had a habit of never showing up for George Low's change boards, and it really infuriated Low that Max would show up late to these meetings. He would lock the door. [Laughter] He would do all sorts of things.

I got worried that Low was going to move the spacesuits out of my division. So I called Max and I said, "Max, what the hell's going on? Why is Low going to move the suits out of my division? There isn't anything he's ever asked us to do that we haven't done and we've done it well."

He said, "What do you want me to do?"

I said, "Get him over to your office."

So I went over and George came in and I said, "George, why are you moving the suits out of crew systems?" I said, "If you've got a problem with Max, take it out on Max, but don't take it out on me."

Well, we talked for a while and he said, "Okay. I won't do it." So we kept the spacesuits.

George Low, he's dead now. He got cancer and he died. But George was really one of the strongest people that I ever met. After the Apollo fire, he was the deputy director, but he took over the management of the Apollo Program. I never went in my office that there wasn't a memo on my desk that George Low had written, every morning. There are people in the program that were exceptional people. George Low was one of them, Max Faget was one of them, Bob Gilruth was one of them. But George Low was just a superb person.

It's sad he got cancer and died. In fact, he was down at M. D. Anderson [Hospital], and I got a call from one of the secretaries out there saying that George had called and wanted me to drop in and see him. I left NASA in about 1980 and I was working at the Medical Center. So I went over to M. D. Anderson and stopped in to talk to George. His wife was there. I spent about five minutes, ten minutes, and I started to leave. He said, "Don't leave. Stay and talk to me a while." So I must have stayed there for an hour. He died about a week later. He was an exceptional man. An exceptional man. He really was. He was a good leader. He was devoted to what he was doing. He was an extraordinary person. He really was. But he's gone. In fact, a lot of people like him are gone.

Okay. What do you want me to cover now? Apollo?

BERGEN: Well, we can go to Apollo, if you'd like.

JOHNSTON: I don't know what else I can tell you about Gemini. The Gemini Program was a very interesting program. There were, I think, twelve flights. The longest one was fourteen days long and we had several others. There were some great guys that flew in that program. Mike [Michael] Collins was one. John [W.] Young was a great guy. Ed White was probably one of the best astronauts that I ever knew. He'd do anything in the world for you. When he was burned to death in that fire, that was a tragic thing. In fact, I went home, I was having somebody to dinner and the guy couldn't come. I was sitting there and I got a phone call and they said, "Dick, you'd better come out here. We've got a problem in the spacecraft."

So I went out to the Center. Then I found out they'd had this fire and those three guys had burned to death. Joe [Joseph F.] Shea was running the Apollo Program Office then and he called me, and he said, "Gulf Stream is going to leave in about an hour to Cape." He said, "I'd like you to go down there with us."

So I said, "Okay."

So we flew down. There was a guy named Frank [H.] Samonski, who worked for me, who went with me. They put us up in the crew quarters, which I hated. But I spent about ten days down there looking at the spacesuits and whatever. I think really, as a result of that, most of us came back with a renewed feeling that we needed to do more to make that thing safer.

I was invited—not invited, I was directed to go up and testify before the Senate Space Committee, which I did. Funny thing is, on the way back we landed up at Hobby [Airport] and a big ball of flame busted out of the wing right up in the window by where I was sitting, which scared me to death. It was a tough time in my life, it really was.

But I think everybody who worked for me, and I had a lot of very devoted people, we trusted each other. We worked well together. We all got together and said, "Look, we're going to get this straightened out," and we did. But they were tough times. For Gus [Virgil I.] Grissom and Ed White and Roger [B.] Chaffee that died in that fire, it was just something

that shouldn't have happened. Part of the reason that happened was there was a lack of discipline in what they put in the spacecraft. Now, we got blamed for having 100 percent oxygen, and that was a contributing factor, but that thing was just full of all sorts of stuff and when it went off, it went off like a bomb.

That was a tough period in my life, I'll tell you. It really was. I really had kind of a rededication to doing what I thought was right for the program. I got all the people working for me together in our conference room and we went over and talked about it. Consequently, we did an awful lot of things. We come up with new materials that wouldn't burn. We just did a lot of stuff. We also changed the atmosphere, so that it was not 100 percent oxygen on the pad, which was not a good thing. In retrospect, I understand that now.

There was a guy in headquarters that was trying to get me fired because we had that. He blamed it on me, which is okay. But it wasn't my fault, any more than it was anybody else's, because we had 100 percent oxygen in Mercury, 100 percent oxygen in Gemini. The problem was the lack of discipline in what they had in the spacecraft. I don't know where the spark came from that started it, but it was just like a bomb when it went off.

I'll always remember, I was down there, I went out on the airplane when they loaded those caskets on board the plane. That was just almost more than I could take to watch them load those guys on. But I came back with a new dedication to doing what I thought was right and we did. We did. I don't know why I'm telling you the story of my life, but they were tough days.

Where do you want to go from here? Do you want to talk more about Apollo or Gemini, Skylab, what?

BERGEN: We can talk some more about Apollo if you'd like to talk some more about Apollo.

JOHNSTON: Okay. Well, it was funny. I got pretty close to Dr. Gilruth as a result of that fire. He called me one day and he said, "Dick, would you come over here? I want to talk to you about something." He said, "Would you mind coming over as my special assistant?"

I said, "Gosh, I don't know. I love the job I have. I've got to think about it overnight."

He said, "Sure."

So I went home and talked to my wife and I said, "You know, the old man wants me to come over there. I hate leaving crew systems, but if he wants me, I better do it."

So I called him the next day and he said, "Come on up."

So I said, "Yes, I'll come over."

There'd been a guy named Paul [E.] Purser there. That's whose job I took. He walked out and left everything in his office. So I go over and his secretary's there and I said, "Would you go get some boxes?"

She said, "Why?"

I said, "I want to box all this junk up." I said, "I got all the stuff in my office I'm going to bring over here and I don't want Purser's stuff around." So I took over the office.

I was about four or five months into that job, maybe even six, and Gilruth called me in and he said, "The lunar receiving lab is in terrible trouble." He said, "If we don't get it straightened out, it's probably going to delay us going for Apollo 11." He said, "Could you go there and straighten it out?"

I said, "If you want me to, I'll be happy to."

So I went over. I got everybody together in a big conference room there. I said, "Look, I've been asked to come over here to straighten this place out. This place is a mess and you know it. We're going to get it done and we're going to get it done in time for the Apollo launch, so stand by."

I got a couple of guys that I knew well, had them come over with me, and we straightened that place out. There was a sign that was from—I can't think of his name now.

Anyhow, I had a bright sport coat on and he made some smart remark about my sport coat. I looked down and this guy's got sandals on and no socks. [Laughter] So I said, "Hey, look, any son of a bitch that doesn't have enough sense to wear socks, why are you picking on my sport coat?" Well, he and a couple other guys went over to Gilruth's office and protested him sending me over there. When the mission was over, they went over and said it was the smartest thing he ever did, because we got the thing on line and it all worked. And I worked my butt off on that thing.

In fact, I was invited to go out to Hawaii, take my wife, and I told Jean, "Jean, I really don't feel like going to Hawaii. If you want to go, I'll go, but I don't want to do it." I said, "I haven't been around you and the kids for so long, that I'd just as soon take a week off and let's go someplace on vacation by ourselves."

So I called the people back from Litman [phonetic]. Women couldn't understand why I wouldn't do it. I said, "Well, I've been working eighteen hours a day for the last two months or three months. I've never been to Hawaii, but as much as I would like to go, I think I owe my family more than going to Hawaii."

So she said, "Okay." So they got somebody else to go. But we would have had a grand trip. They were first-class seats and whatever.

After that mission was over, I'll tell you what I did. Jean and I got invited to the presidential dinner that [President Richard M.] Nixon flew out in California after that. We flew out there and stayed in the Century Plaza Hotel. It was a glorious night. I met more people that I never, ever thought I would meet. [Laughter]

But anyhow, I stayed there as Gilruth's special assistant for the better part of a year. Then one day Jim McDivitt called me. He was running the Apollo Program Office. He said, "Would you mind coming down and talking to me for a minute?"

I said, "No, Jim. What do you want?"

He said, "I need somebody to handle the government-furnished equipment and develop the experiments for the next three missions."

I said, "Well, I'll tell you the truth, you know, I like the job working for Gilruth, but I'm not really involved in hardware and stuff. I'm a hardware-oriented person. I don't want to make a career out of that job up there. It's not going to lead me to anything." So I said, "Look, I'll go up and tell the old man you want me to come down there and, yes, I'll come down."

So I went down and went to work for him. Well, I took my family to the Cape to see a launch. They wouldn't let my son into the viewing area, which really just irritated me. So we went out on the island and Apollo 13 was launched. That's the one that had the big problem.

So we drove on out to the island and were starting back, and we heard that they'd had this problem in flight. So I said to Jean, "Jean, I think I'd better get on back to the [Johnston Space] Center as quick as I can."

So we stopped somewhere, I don't know where it was, someplace in Florida and then we drove all the way on in. What a mess that was. It really was a terrible mess. I got involved with the accident investigation and a lot of other stuff. That should never have happened. The sad thing about it, after the Apollo fire, I think everything in the spacecraft had been looked at, except the wiring in that oxygen tank. It was a spark, and when that spark went off, it blew that tank off, which blew the side of the spacecraft or the service module off. We were lucky we ever got those guys back.

Anyhow, after that was over, I'm sitting in my office one day and Dr. [Christopher C.] Kraft [Jr.] and Dr. Gilruth—and Chris Kraft called me. I go up and sit down and talk, and they talk and they talk and they talk about Chuck Berry and the medical stuff and blah, blah, blah, blah. I finally said, "What are you guys driving at? Are you asking me if I'll go to work for Chuck Berry?"

They said, "Yes."

I said, "Look, you know, I like Chuck personally. I don't think he's any manager. I don't think you do. But if you want me to go there, I will." But I said, "I got one request, that I'm going to run the hardware. I don't want him butting into it."

They said, "Well, if that's the way you want to do it, do it."

So I went to work for Berry. I went and hired three or four guys that worked for me in crew systems and I hired a guy named John [C.] Stonesifer. Anyhow, I redid that branch and we picked up and we took over and got all that hardware straightened out. In fact, we had a fifty—oh, I don't know how long the thing was, a fifty-six-day chamber run with all this hardware and it all worked perfect. We had some problems which we corrected, but we didn't have one problem in flight.

The Skylab Program was a very interesting program, especially from a medical viewpoint, because we flew, I don't know, twenty-eight or twenty-six days, and then a fifty-two, and then, I think, an eighty-six-day mission. It was a great program. It really was.

I remember after the second Skylab mission, Berry was up in headquarters and he had this group of outside doctors. We went and briefed them, and the next thing we know, we get a directive that we're going to have to put all the astronauts through, when they get back, into—I can't remember now what the hell they called it. They sent us a written directive that we would do this. So I went up and talked to Gilruth. I guess Kraft was running the place by then. I said, "Chris, I don't want to do this, but if we're going to do it, we're going to dry-run on this before we go."

So the hospital, which is across the street, was not really occupied then, so we moved all of our gear over there. I had two doctors, one was a German, one was a British doctor. I got the idea we ought to try to get some involvement of people from Europe. The guy's name is Ed Bachard [phonetic] and he was in excellent shape. He was the first guy we were going to put through these tests. We stopped his heart. Now, he survived. Well, they called me

and he said we just about killed him. I said, "Well, I'm going to tell you what you do. I want you to pack all that equipment up, move it back across the street."

So I went up to Kraft, and I said, "Chris, we just about killed somebody. I don't think we ought to be doing this. If you'll back me, I'm going to send a telegram to Berry and tell him." In fact, Berry was going to be one of the subjects. I said, "I don't think we ought to do it, and if the management of the agency wants to do it, they can do it. But they're going to be responsible for it, I'm not." So Chuck came by my office and I said, "Chuck, you know, we just about killed Ed Bachard."

He said, "Yes. Well, what about it?"

I said, "Well, we're not going to do the test after the mission. We've sent a telegram up to the administrator and a copy of it to you. So you guys can do what you want. If you want to direct us to do it, we'll do it, but we'll do it reluctantly." We never heard another word from them.

The administrator then was a guy named—I can't even think of his name. He really wasn't much of an administrator. So anyway, we flew that last mission.

I remember I went over and had dinner with the last Skylab crew. We had them in quarantine. I said, "Look, I want to tell you guys something. Chuck Berry's insisted we do this. We don't want to do it. If any of you don't want to do it, then get your back-up to take your place." But I said, "We're going to try not to do it."

So they said, "Okay." So they flew. I guess they were about two weeks into the mission when we had this problem. Somehow we got word to them not to worry about it, they weren't going to have to do this. It was really kind of stupid for practitioners to be telling us what to do for people who have been weightless for—they were going to be weightless for eighty days and then bring them down and put them in a test like that. We could have killed them.

So anyhow, Skylab was a very interesting program. I guess the one thing I did when I took over the directorate after Berry left, the astronauts always complained to me that the medical people never, ever put a book out. So Apollo was just about over and I got all the doctors together and all the Ph.D.s and whatever, and I said, "I want to tell you guys something. When the last thing's down, you guys stand by because we're going to write a book about the medical results of Apollo," which we did and published it.

Then after Skylab, we also published those results and we got the first publication out. We had a big conference over in the Gilruth Center. Well, I don't think it's called the Gilruth Center. But went through all the results. We got that done probably within two or three months after the last mission. It's a big, fat book, so big.

I don't know what else I could tell you about Skylab. Skylab was a very interesting program to work on. It's too bad we didn't have something to keep the lab up there so we could have gone back and revisited, but it burned up and came in in Australia, I think.

Then after that was over, we tied up with the Russians for a mission with the Apollo-Soyuz. Deke Slayton was one of the guys who was going to go. Deke, by the way, well, he's just like Al Shepard. Al never was able to fly in Gemini. He had some kind of an ear problem. That was taken care of and he flew on Apollo 14.

Anyhow, it was really not so much of an important scientific mission so much as it was trying to do something with the Russians. They rendezvoused and docked and exchanged stuff and so on, but when they came back in, somebody popped the relief valve and it let in some poisonous gas. We got word of that right after they landed. So I called Chris and I said, "Chris, you know, we've got a problem."

He said, "Well, I'll meet you out at the Center."

So we went out to the Center. It was late at night. We started calling around. We found some quarters in Hawaii that we could take them to. We had to kick some generals

out, but we did. We brought the guys back and they spent probably ten days over there until we were sure they were okay. Then we brought them on home.

Deke Slayton, by the way, was a great guy. He did not like, particularly, Berry. Not many of the astronauts did. When I took it over, I went up to his office and I said, "Deke, I didn't ask for this job; I got it. I'm willing to sit down and talk to you about anything we're going to do. If you don't like it, then we can talk about whether we're going to change it or whatever." But I said, "I think it would be better if you and just decided that what we're going to do and do it." So that's the kind of way I dealt with him.

JOHNSTON: He only went to the director on one thing, and the director supported me and not him. Unfortunately, he got—I don't know what he had, but he had some kind of cancer that took him away. But he was a great guy. In fact, that whole original seven, it was just a good group of people. Well, the best one was John H. Glenn [Jr.]. The next was Al Shepard. The next one was Deke Slayton. From there on it kind of went downhill. Wally [Walter M.] Schirra [Jr.], when he flew his Apollo mission, he decided he didn't want the cameras on and he didn't want this on and he didn't want that, and he pulled all his plugs up there. Well, that infuriated Chris Kraft, and Wally never flew again. Neither did the two guys that were with him. But the rest of the guys, they were okay, but they weren't the quality of people that Glenn and Al Shepard and Deke were.

What else can I tell you? You know, I could go back into a lot of stuff with you all. I don't if that's what you really want.

BERGEN: We'd love for you to.

JOHNSTON: Really?

BERGEN: Yes. If you want to do another interview another day to go more in-depth into things, we can do that, too.

JOHNSTON: Well, I don't mind coming back over here another day. I'll get some notes together and talk about some of the things that I think would be interesting.

BERGEN: Okay.

JOHNSTON: You know, you have a tendency when you're doing something like this, to talk about the people and whatever went on. That's interesting, but I think a lot of things that have to do with the hardware and how it all fit together. Let me think about it. Maybe I'll run over next week.

BERGEN: Okay. That would be wonderful. That would be wonderful. We can do that. We can talk more in-depth and we can talk about specifics, if you want to go into about Mercury and then maybe about Gemini. Or however you would like to do it. Whatever you're comfortable doing. We would love to hear about it.

JOHNSTON: Let me go over and look through my notes and stuff on the Mercury, Gemini and Apollo Program, and really, Skylab. Skylab was a hell of a program. I mean, really. We flew guys for eighty-two days, I guess. We learned an awful lot about the medical aspects of going into space from the Skylab Program. Yes, let me think about it. I'll put some notes together. I'll come back over and talk to you.

BERGEN: Wonderful. That ought to be great. We'd appreciate it.

[End of interview]

U.S. Human Spaceflight Chronology

Program	Date Period	Program Duration
Mercury	5/5/61 - 5/15/63	1 yr. 8 mo.
Gemini	3/23/65 - 11/11/66	2 yrs.
Apollo	10/11/68 - 2/7/72	3 yrs. 4 mo.
Skylab	5/25/73 -11/16/73	8 mo.
Apollo-Soyuz	7/15/75	1 flight

Five major human spaceflight programs in 14 yrs.

Shuttle	1981 – 2011	30 yrs.
ISS	Started in 1998; completed in 2011	13 yrs.+

Two major human spaceflight programs in 30 yrs.

AEVA Project Funding - 21 Year History Overview

Mission Objective	Time Frame	Sponsoring Organization	Status
SEI/First Lunar Outpost (FLO)	1990-1992	NASA/HQ's (Code X) New Iniatives Office (NIO/JSC)	**CANCELED** (Office Disbanded)
"Fast Track" Zero-G EMU	1993	NASA/HQ's (Code R)	**CANCELED**
Common EMU (w/Russians)	1993	NASA/ISS Office (Effort originally part of ISS S.O.W.)	**CANCELED**
X-Suit Project	1993-1994	NASA/HQ's (Code U) "Purple Team"	**CANCELED**
Next Generation EMU	1995	NASA/HQ's Office of the Chief Engineer (Jon Coward)	**CANCELED**
Human Lunar Return	1995-1996	NASA/HQ's (Dan Goldin)	In-house study (emphasis shifted to Mars: **Placed on Hold**)
Destination Mars	1996	NASA JSC Human Lunar Return Team (Re-formatted)*	New National Space Policy (Robots on Mars by 2000) *Human exploration an unknown
Advanced Space Suit Project	1997-1998	NASA/HQ's (Code U/M) JSC EVA Program Office (Code XA)	**Funding was embargoed** (only a portion released late FY98)
Advanced EVA Technologies	1999	NASA/HQ's (Code M)	**No FY99 funds planned**
Space Launch Initiative (2nd Gen RLV Tech Dev.)	2001-2002	NASA/HQ's (Code M)	**CANCELED**
Constellation Space Suit (Lunar Surface Suit)	2004-2006	NASA/HQ (Code ZX) Constellation Project Office (Code ZA)	**Funding ZERO (0) in FY07 & sub**
Constellation Program (CxP)	2010	NASA/HQ's (Code ZX) Constellation Program Office (ZA)	**CANCELED** (Office Disbanded)
"Flexible Path" Human Exploration	2011--	NASA/HQ's (Code ZX) Exploration Systems Mission Directorate	**"A Work in Progress" ?**

"Where Did The Old NASA Innovative Spirit Go?"

When we first got started, we were an excited, barnstorming bunch. Our technology was new, and we made lots of mistakes. But through sheer dedication, common sense, and the excitement of doing something that no one had ever done before, we accomplished a great deal.

This gave us a good commodity called "experience". Then someone said, "Let's write down our experience so we won't make any mistakes." So we wrote reports to each other and documented our achievements and results. This took time from our design work, but dedication, common sense, and inspiration from our leaders pulled us through to accomplish more good innovative results.

It also gave us more experience, and someone said, "Let's codify our experience into formal manuals and procedures so we don't make any mistakes and eliminate risks and teach others." So we did.

Eventually, micromanagement, program pressure and milestone dead-line demand put us on a grueling commitment schedule, that reading the mass of manuals and procedures (let alone trying to fully understand them) took so much time from actual design, development and testing work that something had to go.

The thing that went was the innovative "spirit". With procedures and rules to guide every step, who needed inspiration? But when the spirit went, so did the dedication and common sense.

This precipitated even developing more procedures, rules and regulations, and all thoughts of imagination, technical excellence, accountability, responsibility and personal contribution were buried in a bitter, deadly serious game of "Follow the Procedures"

As the procedures, rules and regulations burgeoned, they became even harder to follow; and eventually required so many review cycles, check lists, signatures and approvals that eventually the risk to be innovative ground to a halt. No one could move without violating some procedure, rule or regulation.